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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,000	02/01/2006	Kwang-jin Lee	NEK-0012	9626
23413 7590 04/28/2009 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER LENIHAN, JEFFREY S				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
04/28/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

### Office Action Summary

**Application No.**

10/567,000

**Applicant(s)**

LEE ET AL.

**Examiner**

Jeffrey Lenihan

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3, 4, 7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 7 and 9-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. This Office Action is responsive to the amendment filed on 01/16/2009.
2. The objections and rejections not addressed below are deemed withdrawn.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The instant claims as written depend from claim 2, which was cancelled in the amendment filed on 01/16/2009. The examiner notes that for the purposes of examination the claims have been treated as depending from amended claim 1, which now contains the limitations formerly recited in claim 2.

***Claim Rejections - 35 USC § 103***

6. Claims 1, 3, 4, 7, 9-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al, WO 2004/058839, in view of Miyatake et al, US5804655.

The rejection stands as per the reasons outlined in the previous Office Action, incorporated herein by reference.

7. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ahn et al, WO 2004/058839, and Miyatake et al, US5804655 as applied to claim 16 above, and further in view of Hamilton et al, US6730734 and Goldman et al, US4278576 .

The rejection stands as per the reasons outlined in the previous Office Action, incorporated herein by reference.

8. Claims 1, 3, 4, 7, 9-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuji et al, US5298559, in view of Miyatake et al, US5804655.

The rejection stands as per the reasons outlined in the previous Office Action, incorporated herein by reference.

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Fuji et al, US5298559, and Miyatake et al, US5804655 as applied to claim 16 above, and further in view of Hamilton et al, US6730734 and Goldman et al, US4278576 .

The rejection stands as per the reasons outlined in the previous Office Action, incorporated herein by reference.

### ***Response to Arguments***

10. Applicant's arguments filed 01/16/2009 have been fully considered but they are not persuasive.

11. Ahn teaches a seed/core/shell impact modifier wherein said core comprises an alkyl acrylate and a cross-linking monomer, corresponding to the acrylic rubber recited in the claims. Applicant argues that Miyatake teaches silicone rubber modified-acrylic rubber particles wherein said acrylic rubber is required to contain an unclaimed monomer A-3. Applicant argues that, because monomer A-3 is required by Miyatake, it would not have been obvious to one of ordinary skill in the art to omit monomer A-3 when combining the teachings of Ahn and Miyatake to produce a hybrid rubber core wherein the acrylic rubber consists of only an alkyl acrylate and a cross-linking monomer as recited in the currently pending claims. Applicant submits that the same arguments apply to the combination of Fuji and Miyatake.

12. Miyatake states that compositions containing less than 0.1% of monomer A-3 are characterized by a lowering of impact resistance (Column 7, lines 39-42). Miyatake therefore teaches the use of less than 0.1% monomer A-3 in the preparation of compositions having alternative properties of lower impact resistance.

13. Comparative Example 1 of Miyatake discloses the addition of a commercially available acrylic rubber impact modifier to PVC to produce a resin having an Izod impact strength at 23 °C of 30 kg\*cm/cm (Table 7) (Column 20, lines 26-67). Comparative Example 6 discloses the addition of a silicone rubber-modified acrylic rubber particle to PVC to produce a resin having an Izod impact strength at 23 °C of 60 kg\*cm/cm (Table 27; Column 27, line 65 to Column 8, line 26). The examiner notes that the acrylic rubber component of the impact modifier of Comparative Example 6 comprises only butyl acrylate and allyl methacrylate; monomer A-3 is omitted (Table

26). Miyatake therefore discloses that the modification of acrylic rubber with silicone rubber improves the impact resistance properties compared to unmodified acrylic rubber even when monomer A-3 is omitted. The examiner takes the position that it would have been obvious to one of ordinary skill in the art to modify the impact modifiers of Ahn or Fuji with a silicone rubber, as taught in Comparative Example 6 of Miyatake, to prepare an impact modifier suitable for use in applications in which moderate improvements in the impact resistance are desired.

14. Applicant further alleges that unexpected results are obtained from the use of the claimed polymer, and cites the data from Example 5 (see Table 1, page 32 of specification). The examiner takes the position, however, that the allegedly unexpected results are not commensurate in scope with the claims as they are currently written.

15. The examiner notes that the four impact modifiers tested in Example 5 all comprise 2.5 pbw of a seed, 82.5 pbw of a hybrid rubber core, and 15pbw of a shell. The claims as written, however, disclose the preparation of polymer particles comprising 0.01 to 10 pbw seed, 60 to 94 pbw hybrid rubber core, and 6 to 40 pbw shell. Applicant therefore has not demonstrated that the allegedly unexpected results may be obtained from impact modifiers prepared by combining the seed, hybrid core, and shell in the broad range of ratios allowed by the instant claims.

16. Furthermore, Table 1 of the specification shows that the seed for each of the tested impact modifiers comprises 89.2% by weight styrene, 10% by weight acrylonitrile, and 0.8% by weight divinylbenzene. The independent claims, however, only recite that the seed is prepared from "60 to 99 pbw of a vinyl monomer, 0.5 to 30 pbw of a

hydrophilic monomer, and 0.5 to 5 pbw of a cross-linking agent." The cited Examples therefore do not reflect the broad scope of either a) the broad range of monomers suitable for use in preparing the seed, or b) the ratios at which the different types of monomers are combined to prepare the seed envisioned by the claims as currently written. The examiner takes the position that similar arguments apply to the composition of the acrylic rubber of the hybrid core, the silicone rubber of the hybrid core, and the shell, as the cited Examples all recite the use of the same monomers combined in similar ratios to prepare each of these polymer components. The examiner therefore takes the position that applicant has not demonstrated that the allegedly unexpected results may be obtained using the broad spectrum of polymer compositions encompassed by the instant claims.

### ***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period **will** expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) **will** be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Lenihan whose telephone number is (571)270-5452. The examiner can normally be reached on Monday through Thursday from 7:30-5:00 PM, and on alternate Fridays from 7:30-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Irina S. Zemell/  
Primary Examiner, Art Unit 1796

Jeffrey Lenihan  
Examiner, Art Unit 1796

/JL/